TEXTILE *Technology* DIGEST

Read By The Principal Executives Of More Than 8,000,000 Spindles

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Textile Highlights of The Month

Textile Reader's Digest

MACHINE DETECTS SLUBS, CUTS YARN FOR REMOVAL

Now available is an electronic device that detects slubs in yarn while it is being wound from spinning bobbins to cones or other packages and cuts the yarn ahead of the slub so that it can be removed by an operative. The apparatus, designated the "Linra" Photo Slubber, is designed so that the winding operation cannot be performed without the yarn passing through the cutting head. The equipment is suitable for continuous 24-hour-a-day operation.

A central power unit is employed to operate an individual optical unit for each winding head.

Air at a pressure slightly above atmospheric is fed to the optical head, thereby preventing risk of faulty operation due to accumulation of lint and dust in the slit.

Dawe Instruments Ltd., Hanwell, London, England. Staff. *Textile Industries 116* 162 (November, 1952).

WHAT'S NEW FROM BRITAIN IN MATERIALS HANDLING

Two new ideas came from the 1952 Exhibition of Materials Handling in London. The first one, judged by a photograph showing its use in a British textile mill, is of direct interest to American textile men.

This new equipment was described as a battery overhead conveyor which is used to convey full cans of drawing sliver from finisher drawing to slubbers. A photograph shows the textile application. It is further described as follows:

The battery operated conveyor is particularly suited to installations where movement is intermittent. The unit is mounted on an overhead monorail track and power driven by a ½ h.p. 24 v. d.c. motor. Primary drive is by V rope and final drive by roller chain. The power is supplied by a "Kathanode" battery of 24 amp. hour capacity. Travelling speed, may be varied, but it usually is set at 100 fpm. Forward, reverse and stop switches are mounted at a convenient height for the operator. Ultimate limit stops can be fitted at desired points along the track. Mfr: J. & H. Lowe Ltd.

The second new idea was the cable belt conveyor. This revolutionary conveying method makes feasible single conveyors up to 3 miles in length, and has a multitude of operating advantages and economies. It is already being successfully used and will undoubtedly be a factor in most future conveyor thinking.

The main operating principle of the cable belt conveyor is that two steel ropes, one at each side of the belt, to take the driving pull. The belt is of single-ply construction. It is made of 32 oz. duck, with a 3/16 in. thick top cover. There are spring steel straps moulded into the belting at intervals of from 2½ to 4 ft., depending upon the width of the belt. These straps extend across the belt and project a few inches at each side. Shoes, consisting of a steel pressing with rubber grips are fitted at the ends of each strap and rest on the rope. When the belt is loaded it takes a troughed form and the strap is deflected.

The advantages of this cable belt conveyor from Cable Belt Ltd., are many:

1. A light single-ply belt can be used regardless of the h.p. of the conveyor.
2. Edge wear of the belt is greatly eliminated.
3. The number of supporting pulleys is reduced by between 60 and 80 percent.
4. Friction losses in the conveyor are greatly reduced due to the elimination of the flexing of the belt and material passing over the troughing rollers.
5. Fire risk is greatly reduced as no creep is possible between a driving drum and belt, nor can the belt rub against side supports or jammed idlers.
6. The lighter belt and the reduction in the number of supporting idlers reduces the initial and the replacement costs.
7. The elimination of a continuous structure to support idlers reduces costs, and makes for an open construction which is easy to keep clean.

Anon. *Modern Materials Handling 7*, 62, 63, 64, 65, 66 (September, 1952).

SWISS LOOM FEATURES PATENTED MAGAZINE

Kurt Schwabe A. G., Lecole, Switzerland, as represented in this country by Ernest L. Frankl Associates, announces a fully automatic Pick-A-Pick loom with five shuttle boxes on each side and automatic bobbin exchange for four different colors. The patented magazine containing up to four different colors is positioned by a fractional horsepower motor to fill any empty shuttle with the correct color yarn selected by an electronic

color detector. The worsted-type loom is available in four widths, from 72" to 96". The loom has no superstructure and the heavy worsted-type dobby, providing for up to twenty-five harness, is mounted on the side of the loom which is said to offer special advantages for weaving draperies and outerwear fabrics. Anon. *Textile Age 16*, 52 (November, 1952).

COST VARIABLES IN DETERMINING ROVING PACKAGE SIZES

The subject of large-package production has been a major topic of interest in the textile industry for some time. The use of 14-inch cans for carding and drawing are not new. Nor are roving frames which will make packages containing up to 55 or more ounces. The latest increase in package size has been in spinning, where it is now possible under suitable conditions to make 11-inch packages containing approximately 16 ounces of yarn per bobbin.

The advantages of large-package production are clearly defined; the savings and economic advantages are relatively easy to ascertain. But the determination of the most economical roving package size that should be made in a given mill can only be discovered after thorough study by the mill of all the cost factors involved.

In many instances, it will be discovered that the largest roving package size is not the cheapest. It is quite possible and indeed probable that for some mills the production of a 10" x 5" package will result in lower yarn costs than a 12" x 6" for example.

Basic considerations in package studies are:

1. All studies should be based upon the mill organization—the yarn counts manufactured and the hank roving desired—it being obvious that factors influencing the machinery, methods, practices in a coarse yarn mill running 7's to 15's will be dissimilar to those in a combed yarn mill producing 40's to 120's.

2. The major savings that can be made by increasing the roving package size are made in only two areas: The reduction of doffing costs on the roving frames and the reduction of creeling costs in spinning.

3. The production of large packages required larger roving frames and a substantially increased number of spindles than is needed for the same quantity of production on smaller frames. It must always be kept in mind that, contrary to commonly conceived thinking about machinery, the larger the roving frame the lower the rate of production per spindle. One of the most important factors in this reduction in machine speed is the mechanical limitation in the function of the flyer.

For example, to secure the same amount of production from 10" x 5", 11" x 5½", and 12" x 6" roving frames, the number of spindles required increases 20 and 33⅓ percent respectively.

4. Against the savings described above that can be made, there are also increases in costs that must be considered, to determine to what degree the savings are offset. The factors influencing these costs are as follows:

A. Mill Building Costs—which include floor space required, taxes, insurance, and depreciation.

B. Machinery Costs—which include taxes, insurance, depreciation, and interest.

C. Power Consumption.

D. All Labor Costs—in roving and spinning.

Our objective here is to point out the factors involved when a mill is purchasing new roving machinery and determining the most economical roving package size. Only those factors influencing the roving production will be introduced, and the spinning room costs will be treated in a succeeding article.

Let us assume that the mill intends to produce 1.00 hank roving from 60 grain drawing sliver, 1 1/32 SLM cotton, on a Whitin Interdraft roving frame to spin approximately 850 pounds of 30's warp yarn per hour. Should the mill purchase 10 x 5 x 8, 11 x 5½ x9, or 12 x 6 x10 frames?

Floor Space

The mill must have sufficient floor space to accomodate the spindles required to produce the necessary poundage of roving to supply the spinning. The space required will vary about 5.23 sq. ft. per pound hour on 10 x 5 to about 9.42 sq. ft. on 12 x 6 frames per pound hour. The reason for the difference is due to the wider gauge and lower spindle speeds of the larger package frame. This space allowance includes storage of drawing cans and a reasonable area for storage of both empty and full roving bobbins and trucks.

Floor space required must be calculated on each of the three sizes of frames. This is a comparatively simple calculation.

1. Determine the pounds of roving required per hour to supply the spinning room, plus a reasonable allowance for waste and a safety factor.

2. Determine the actual pounds of roving per spindle per hour on each size roving frame.

3. Divide the total pounds required (1) by the actual pounds per spindle per hour, (2) the result being the minimum number of spindles required.

This calculation must be performed for each of the three sizes of frames.

4. Next determine the number of spindles per frame most economical for operation, keeping these factors in mind:

a. The maximum number of spindles per frame from a mechanical viewpoint.

b. The maximum number of spindles per frame from practical economical mill operation, as an operator is assigned a certain number of frames and not a certain number of individual spindles. It should be remembered that the smaller the number of spindles per frame, the higher the initial price per spindle, and the greater the number of frames that will be required. This factor increases the number of motors, motor supports, and other extras, all adding up to a higher initial investment for the same number of spindles. If possible, the maximum number of spindles per frame should be selected.

5. Divide the total spindles required (3) by the number of spindles per frame of each of the three sizes of frame. The result will be the number of frames required. Since the number of spindles required (3) is the minimum, any fraction of a frame must be considered a full frame.

6. Plan to arrange the frames in the mill according to the available floor space, allowing for cross alleys, storage, and considering the factor of how many frames each operator will run. If a new mill is planned, floor space can be accomodated to the frame size most economical to use.

Investment Cost Per Pound

The investment cost for each of the three sizes of frames is then determined, multiplying the number of frames required by the prices of the various frames plus extras.

The productive cost per pound on the initial investment for each size roving package will be the next step in the cost analysis.

First, the mill should determine the number of anticipated hours of operation for the year. A good method to follow is to establish the average hours per week the mill expects to operate. Multiply this figure by the number of weeks in the year. Subtract from this result the number of hours the mill is closed for holidays, vacation period (if any), and any other period the mill is closed. The result should be the actual operating hours per year.

Compute taxes, insurance, depreciation, and a conservative interest rate on the machinery investment for each roving package size, on an annual basis. Divide the total by the operating hours per year. The result will be the total hours for the items listed. Divide the cost per hour by the pounds per hour for the items listed. The results thus obtained will be the productive cost per pound on the investment in each case.

Computing Labor Cost

Indirect labor and room general labor on each of the three sizes of roving packages should be so nearly equal, that for the purpose of this comparison they may be ignored. The cost per pound for roving tenders should be considered, as this may vary from mill to mill on different sizes of roving frames. It might be well to note at this point that in some mills it is customary to pay the roving tender a higher hourly rate for 12 x 6 than on a 11 x 5½ and also a slightly higher rate on 11 x 5½ than 10 x 5.

After determining the operator's spindle assignment on each size of roving frame, the pounds per operator per hour can be calculated by multiplying the spindle by the pounds per spindle hour. By dividing the operator's rate by the pounds per operator per hour, the cost per pound will be obtained.

Power Costs

Power consumption may be a very important factor in the comparison between the costs of the three package sizes. By multiplying the K.W. required per frame by the rate per K.W.H., the cost of power per frame per hour can be determined. Divide the cost per hour by the pounds per frame hour; the result will be the cost per pound for power.

Summary of Roving Costs

For each size roving package: add the productive cost per pound on the investment, the cost per pound for direct labor, and the productive cost per pound for power. The totals thus obtained should show the total cost of each size roving package. These cost figures should be sufficiently accurate for all practical purposes in determining the most economical size frame to purchase. Further consideration in the effect cost-wise of the different sizes of roving packages in the spinning room will be discussed in a later article. (*The Whitin Review*, September-October, 1952.)

COTTON MERCHANT OFFERS TECHNICAL SERVICE

An additional technical service being rendered by a cotton merchant improves mill operating efficiency and often results in substantial savings in the purchase of cotton. Having its own fully-equipped testing laboratory, the merchant is able to deliver cotton of specified fineness and strength to produce an even running mill mix.

The technical service representative usually

suggests mixes of varying fineness levels for preliminary mill runs. He then consults with the mill personnel to determine further the mill needs, and follows through on such test factors as waste, neps, ends down, yarn strength, etc.

When the desired mix is determined for best processing conditions, the merchant is able to supply cotton of that type.

An example of the technical service is that of the South Carolina plant which saved approximately $5 a bale on basis, and considering the waste factor, savings amounted to about $7 per bale. Also, ends down were reduced and yarn strength increased 17%. As a result the mill is now buying on specification in a guaranteed fineness range.

The technical service of the merchant also includes periodical visits by the merchant's technical representative for consultation purposes. Staff. *Textile Industries 116*, 124 (November, 1952).

HATCH MILL OF DEERING MILLIKEN

The public and the world of fashion first became aware of "Lorette," a new Orlon-wool dress goods fabric made by Deering-Milliken, at its debut in the Waldorf-Astoria grand ballroom in May, 1952. Pleated dresses and skirts made from "Lorette" were crumpled, twisted, and washed in a washing machine there and shown to have retained every pleat intact.

A product of a firm that operates 870,000 spindles and 20,300 looms in 29 mills located in five states, this new fabric joined the long array of famous fabrics made by Deering-Milliken for practically every segment of the textile industry, including dress goods, home furnishing fabrics of every description, and industrial products such as tire cord, electrical insulation, and filters, to name only a very few.

Such modern fabrics as "Lorette" have a remarkable history. The Orlon in it did not even exist until a few short months ago. It is a synthetic fiber created out of nowhere by the magic of chemistry, made from such unromantic things as petroleum, coal, air, limestone, gas, and a little water. Analyzed by chemists and textile experts, blended with a natural but highly complex fiber ($C_{42} + H_{57} + O_{15} + N_5 + S_n$) long known to man as wool, processed by skilled hands on complicated machinery, finished and merchandised, the two materials become a new fabric, designed to intrigue our American fancy for something new and something better.

Out of its experience in building seven new mills in the last ten years, Deering-Milliken created what is one of the finest of wool mills in the country, for manufacturing "Lorette." Long before the first line was drawn on a drafting board, every facet and aspect of modern mill construction, modern manufacturing methods, and textile machinery performance was systematically reviewed and studied to be certain that the mill would be capable of producing an outstanding fabric.

The Hatch mill, one of Deering-Milliken's newest, is located in the beautiful valley of the Blue Ridge Mountains in the southwestern part of North Carolina not far from the center of the small town of Columbus. A single story windowless building with glazed white brick exterior, its major dimensions are 300 by 360 feet. The use of truss suspensions in its construction permitted the creation of one large manufacturing area having a minimum number of supporting columns.

The temperature and humidity of the air is 100 per cent controlled. The relative humidity can be kept within 2 per cent variation between wide limits or held within any desired dry bulb reading with a variation of only 2 degrees. It is interesting to note that more than one-half of the electrical power consumption used in the building goes into controlling the condition of the atmosphere.

Combining usefulness with beauty, the aeration pool for cooling the water used in the air-conditioning system is located directly in front of the building in a pleasantly landscaped area.

Unusual attention was paid to achieving the best possible lighting conditions. Closely spaced rows of eight-foot fluorescent tubes line the ceiling, with the result that an even, shadowless light is provided in all parts of the mill, especially in the weaving area.

The mill employs 275 employees on three shifts, manufacturing primarily "Lorette." In this fabric, 55 per cent is Orlon and 45 per cent wool. It is made in plain or fancy weaves in weights varying from 7.5 to 10.5 ounces. The yarn is made of three-denier Orlon combined with fine grade Australian and domestic wools.

The mill is laid out in such a way that a U-shaped flow of work can be achieved. The dye house is situated below a mezzanine floor containing blending bins. After the stock has been dyed and blended, it is moved to the automatic card feeds in the main processing room, which, as mentioned before, is completely open. After the stock has moved through the cards and passed through the spinning frames, which are located beside the ends of the condensers of the cards, it passes across the room to the winding and warping sections where it is made ready for weaving. After coming off the looms, it passes directly to the burling, mending, and inspection

room and then back to the loading platform where the stock originally entered the mill, for shipment to the finishing plant. The Whitin Review. Anon. Page 1, 2, 3. September-October, 1952.)

SLIVER TESTER MEASURES LENGTH OF FIBERS

An automatic top testing machine manufactured by N. Schlumber & Cie, Guebwiller, Haut-Rhin, France, for determining the fiber length in a wool, worsted or synthetic sliver has been introduced in the United States.

Fibers are removed from the sliver being tested and one end of each fiber is secured on a baseline perpendicular to the length of the fiber. The fibers are sorted in zones of decreasing length. These successive tufts are then weighed. Thy show in regard to the whole sample a proportion which enables calculation of the mean length or Schlumberger length, the barbe, and the cumulative length frequency curve. With this information, an accurate characterization of the sliver tested can be made, showing its composition in fibers of various length.

With the assistance of this analyzer, it is possible to create in twenty to thirty minutes an accurate diagram that formerly required three to four hours.

Texplant Corp., 65 Bedford Street, Stamford, Conn. Staff. *Textile Industries 116*, 135 (November, 1952).

BOND MACHINE DEMONSTRATED

The first demonstration of a pilot model of the Bond Machine was held recently at the plant of Hussong-Walker-Davis Company in Philadelphia, manufacturers of the machine. The machine is being sponsored by the Pittsburgh Coke & Chemical Company and is the invention of Boyce C. Bond, Sales Supervisor of Pittsburgh's Fine Chemicals Division.

The machine is a new dyeing and scouring machine which is said to offer among its advantages: unusual versatility in the types of dyestuffs used, flexibility for short runs, better and speedier diffusion of dye solution throughout the fabric, and economy of dyestuffs and floor space. The pilot model is capable of 120 yards a minute, depending upon the type of fabric and class of dyestuff used. Anon. *American Dyestuff Reporter 41*, 721 (October 27, 1952).

WRINKLING DEVICE DEVELOPED TO AID STUDY OF FABRIC CREASE RESISTANCE, RESILIENCE

A newly developed instrument for producing randomized wrinkle patterns on fabric samples which are large enough for later subjective evaluation was described by Dr. R. G. Stoll of Celanese Corp. of America yesterday at the 23rd annual meeting of the Textile Research Institute in the Hotel Commodore.

Dr. Stoll presented results of "Studies on the Resilience and Crease Resistance of Fabrics," in which he discussed at considerable length the principles underlying good wrinkle performance and the shortcomings of present wrinkle recovery evaluation procedures.

"The new device grew out of recognition of the good results which some experts obtain from the so-called clenched-fist test," Dr. Stoll declared, "and the importance of the appearance aspects of crease resistance. We have evaluated, under controlled conditions, a number of methods for producing randomized wrinkle patterns using fabric samples large enough for subjective evaluation. We feel that we have now an instrument which does this job quite well.

"The apparatus consists essentially of an air system which alternately pumps the air out of a group of specimen tubes into another set of specimen containers. The specimen containers consist of transparent tubes which are open to the air. Inside of these tubes are sealed-in rub-

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ber diaphragms. The tubes and rubber diaphragms are set into a head-piece which is connected with the air system and which carries in its center a post to which the fabric sample can be attached in a hose-like manner.

"The solenoid valves are controlled by a recycling timer which can be set so that one set of the specimen containers is 1, 2 or 5½ minutes open to pressure, while at the same time the other set is under vacuum. Under the vacuum the rubber diaphragms collapse and wrinkle the fabric in a random manner, while the specimen in the containers which are under pressure can freely hang out and relax. In addition to the recycling timer, a timer is installed in the circuit which can be set for the intended length of the test. The vacuum produced by the pump, which controls the pressure under which the fabrics are crushed, is recorded by a vacuum gauge.

"After completion of the wrinkling the specimens are removed from the containers for a comparative evaluation. This comparison may be carried out by visual inspection, using a special light box.

"For photo reproduction, colored stereo photography appears to be necessary, since we found that two-dimensional black and white pictures will not truly reproduce the appearance of wrinkle patterns. For examining and recording the geometric pattern an instrument which traces the surface contours, similar to the one developed by Du Pont, will be quite adequate.

"Naturally, we should not expect that this instrument will have the reliability of a statistical designed wear test, nor will it produce basic data on the mechanism of creasing and recovery. However, it has already proven to be a helpful tool in evaluating the subjective crease resistance of fabrics under conditions very similar to those occurring in actual use." Kenneth A. Howry. *Daily News Record 33* (November 18, 1952).

INSTRUMENT MEASURES FABRIC TEMPERATURE WITHOUT TOUCHING IT

The Brown Low Range Radiamatic Pyrometer is used in textile mills for the purpose of measuring fabric temperature in such processes as nylon heat setting or resin curing.

The pyrometer is unique in that it is capable of detecting the temperature of the product without physical contact. It provides a means of controlling from product temperature rather than the inferential readings obtained from measurement of conditions surrounding the product. Staff. *Textile Industries 116*, 129 (November, 1952).

TWO NEW COTTON LOOMS

Hunt Loom & Machine Works, Inc., announces two new cotton looms, the HC 50 and the HL 16. Both looms feature heavy construction in the sides and both are furnished with the Hunt Spreader that has four bearings to stabilize the crankshaft and two additional bearings on the camshaft.

The company points out the following features for the HC 50 loom: (1) The weaving of heavy cotton fabrics up to 64 inches wide; (2) the Hunt No. 8 individual motor drive with demountable gear; (3) roll and shaft, or Brown spring-top harness motion, or 20-harness dobby; (4) a crankshaft of 1⅝ inches; a camshaft diameter of 1-15/16 inches; (5) single or double side-filling stop motion, or a center-filling stop motion.

The HL 16 incorporates; (1) Lighter constructions of cotton fabrics up to 60 inches wide; (2) the Hunt No. 1 drive; (3) roll and shaft, or Brown spring-top harness motion, or 12-harness dobby; (4) a crankshaft diameter of either 1⅝ inches or 1⅜ inches; a camshaft diameter of 1-9/16 inches; (5) single or double side-filling stop motion.

Both the HC and HL looms have these additional features: (1) Beam heads through 26-inch diameter; (2) Midget feeler (optional); (3) Stafford Thread Cutter No. 21 or 23; (4) bobbin lengths of 7⅜, 8 and 8¾ inches; (5) high-roll take-up with worm or nutting bar; (6) Roper, Bartlett, or friction let-off; (7) vibrating, revolving, or Durkin-type whip-roll; (8) drag rolls (optional); (9) electric warp-stop motion of 2, 3, 4, or 6 banks; (10) camshaft or auxiliary-cam motion; (11) latest-type motors, furnished to specifications; (12) gears of cut teeth throughout except for the lett-off pinion; (13) plain or tape selvage motion.

Anon. *Textile Age 16*, 50 (November, 1952).

MICROTOME PREPARES SECTIONS FOR ELECTRON MICROSCOPY

An ultra-high precision micro-tome, designed to cut sections of natural and synthetic fibrous materials to a thickness of five-millionths of an inch, has been developed at Battelle Institute, Columbus, Ohio. It is expected that the new "cantilever microtome" will enable fullest use of the electron microscope for textile as well as other types of research.

The instrument may also be used in the preparation of speciments for light microscopy. Bearing play has been eliminated by avoiding all bearings or ways in its construction.

American Instrument Co., Silver Springs, Maryland. Staff. *Textile Industries 116*, 153 (November, 1952).

ELIMINATION OF HARMFUL INDUSTRIAL SMOG

Over a period of years, York Knitting Mills, Toronto, Ont., and American Moistening Co. have wrestled with the problem of eliminating dirt in the production of yarn.

An initial early trial of various types of throw-away filters proved unsatisfactory in solving the problem. These filters, though probably in the range of 15 to 20 per cent cleaning efficiency, did not remove any of the fine smoke particles which were the real source of trouble in yarn spoilage.

Toronto, of course, presents a very bad local condition from a standpoint of air-borne smoke particles, as is indicated by the table below.

One cubic foot of air over the average industrial city contains between 1,000,000 and 4,000,000 dirt particles made up of smoke carbons, siliceous matter, coal dust, fibrous matter and miscellaneous.

Of these particles, the smoke carbins and the siliceous material comprise approximately 88 per cent of the total (by volume) and are too small (less than 1 micron) to be caught by the mechanical filters.

This table shows the rate of solid deposits on various large cities:

Toronto, 1933—
380-650 tons per square mile per year.
Chicago, 1947—
734 tons per square mile per year.
Detroit, 1945—
680 tons per square mile per year.
Cincinnati, 1946—
408 tons per square mile per year.
Los Angeles, 1948—
400 tons per square mile per year.

After all ordinary methods had been tried, electrostatic filtering was finally considered the only satisfactory solution.

Prior to the study of the dirt problem it had been decided to install a modern evaporative cooling system for employee comfort. This decision involved the introduction of large quantities of outside dirty air. An immediate decision on filtering was, therefore, imperative.

The development of the electrostatic air cleaner has brought forth the possibility of higher standards of industrial cleanliness heretofore considered impossible to achieve economically. Substantial savings can be effected in many instances where seconds are caused by dirt-laden air.

The percentage of spoilage or rejection was running very high in the mill's spinning room, and it was considered absolutely necessary that

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310 St. Hubert Street, Granby, Quebec, Canada

it be reduced. And so we turned to the Westinghouse Precipitron as an answer.

The spinning room spoilage was being caused by minute particles of air-borne dust so tiny as to be invisible to the human eye.

Ordinarily dust can be taken from air by means of filters, cyclones, or air washers. However, such methods are usually incapable of removing microscopic particles, some of which may be as small as 1/250,000 of an inch in size.

The answer seemed to be the installation of a special type of cleaner in the air circulating system to remove these particles, and Precipitron was selected.

The Precipitron consists of three main parts—the ionizer unit, the dust collector cell and the power pack.

The ionizers are supplied by the power pack with 13,000 volts, D. C., creating a strong electrostatic field. As the air passes through this electrostatic field, every particle of foreign matter, regardless of size or make-up, receives a positive charge.

Within the area of the cell itself (known as the collector) are parallel plates, one-half-inch apart, every other plate being charged with 6,000 volts D. C. Upon entering this second electrostatic field existing between the plates, the charged particles are forced toward and deposited on the grounded plates. Upon contact with these grounded plates, the particles lose their charge and are held firmly there, partly by agglomeration and partly by being impinged on an adhesive coating previously placed on the plates.

By blackness test, Precipitron removes up to 90 per cent of all air-borne particles, down to sizes as small as 1/250,000 of an inch.

Now, at York Knitting Mills, spoilage has been reduced to practically nil, it is reported, and the financial saving over a period of a few years will be a large one.

Maintenance is kept to a minimum since practically the only attention required is the regular cleaning of the collector plates to remove captured dirt.

This is done by simply flushing the plates down with hot water once every six weeks. Woven plastic line screens placed at the recirculation openings, and as well before the electrostatic filters to catch both fresh and recirculated air, are cleaned very simply and easily by brushing down with a long handled brush once every day or two.

It is interesting to note that the Precipitron electrostatic filtering equipment was installed with ease on an old wooden floor, six story textile mill. Actually, the Precipitron system has proved easier to maintain than the previous initial systems using throw-away types of filters.

Cost of maintenance is estimated at less than half that of the throw-away types of filters.

The new central station type, duct distribution evaporative cooling system has also contributed in a large part to increased speeds, less breakage due to ends down and less shipping loss due to incorrect moisture content. Milton H. Irons. *Canadian Textile Journal 71*, 71-72 (November, 1952).

VERSATILE MULTI-CAN SLASHER PRODUCES WARPS OF CONSISTENT QUALITY

A multi-can slasher is designed to produce consistent quality warps from a wide range of natural or man-made fibers, at high speed and low operating costs. Furnished with either 5, 7, 9 or 11 31-inch cylinders, the slasher can be adapted and equipped to fill any mill requirements. West Point Machine & Foundry Co., West Point, Georgia. Staff. *Textile Industries 116*, 140 (November, 1952).

LYDIA COTTON MILLS CELEBRATES 50TH ANNIVERSARY

The recent completion of a new addition to the Lydia Cotton Mills at Clinton, South Carolina plus new spinning, weaving and cloth room units, which have increased productive capacity of the mill about 30 per cent, coincides with the company's Fiftieth Anniversary of progress in the textile industry.

It was fifty years ago that the Lydia mill, then only a small plant with a few houses standing in the midst of cotton fields, started operations with 40 employees, 5,000 spindles and 150 looms. The original charter for the mill was filed with the State of South Carolina in 1902 and 136 other concerns were chartered by the state in that year. Today, after 50 years, only 15 of the original firms other than Lydia are still in existence under their original charters.

Lydia is the sister mill of Clinton Cotton Mills, also located in Clinton and built six years earlier. Both mills were founded by M. S. Bailey, pioneer South Carolina textile manufacturer and banker, and have been operated by the Bailey family during the past 50 years. The executive personnel of the Lydia plant today consists of P. Silas Bailey, president and treasurer; George H. Cornelson, vice president; David S. Cook, vice president in charge of manufacturing; J. D. Hairston, secretary; W. C. Neely, assistant secretary; Rob-

ert M. Vance, assistant treasurer. J. B. Templeton is superintendent of the Lydia plant.

With the new additions recently completed at Lydia, the mill now has 1569 looms and 66,240 spindles producing print cloths, broadcloths and tobacco cloths. Anon. *Textile Age 16,* 28 (November, 1952).

X-51 ACRYLIC FIBER MOTHPROOF EASILY CLEANED

X-51 is a new synthetic fiber being produced in two types, a wool-like staple and a silk-like yarn.

Although both the staple and filament X-51 acrylic fiber have undergone experimental mill tests for some time, pilot plant production has not yet hit its full capacity, and no decision on future production plans has been made.

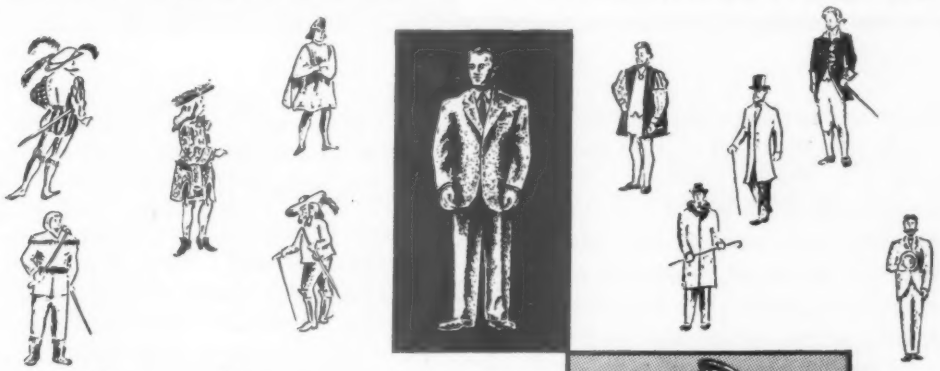
Tests have indicated that staple X-51 can be processed in mills having cotton or woolen equipment. Staff. *Textile Industries 116,* 126 (November, 1952).

DRAPER XD LOOM FEATURES 2x1 FILLING MIXING UNIT

Draper Corporation has developed a new XD loom with 2x1 filling mixing mechanism. This is said to eliminate uneveness in cloth due to variations in filling. The new loom is now available with 2x1 box motion or single shuttle, W2 worsted head or dobby. It is designed for conventional widths up to 80" reed space to give 72" cloth off the loom. Yarn beam can be furnished up to 32" diameter. The loom is versatile because of the fabric range, except for color combinations, which can be woven. It is designed to eliminate or reduce friction and strains on the yarn and it simplifies the operation of tying in broken warp ends because warp yarns are more accessible than previously. In addition, it features a plastic race plate end. Up to 18 harnesses may be run on dobby, up to six harnesses on cam motion and under certain conditions, up to 20 harnesses with the W-2 head.

For weaving rayon, the XD is equipped with a 1⅝-inch lift shuttle box with a 1¾-inch by 1 5/16-inch by 15¾-inch shuttle with a 7⅜-inch and 8-inch bobbins. For blends, the loom is equipped with a 1¾-inch lift shuttle box with a 15/16-inch by 1 7/17-inch by 16¾-inch shuttle with 8-inch and 8¾-inch bobbins. For worsted, the XD is equipped with a 1⅞-inch lift shuttle box with a 2⅛-inch by 1 9/16-inch by 18½-inch shuttle with 8¾-inch bobbin, or with a 10⅛-inch bobbin for certain special applications.

The box motion cam has a 38-degree change,



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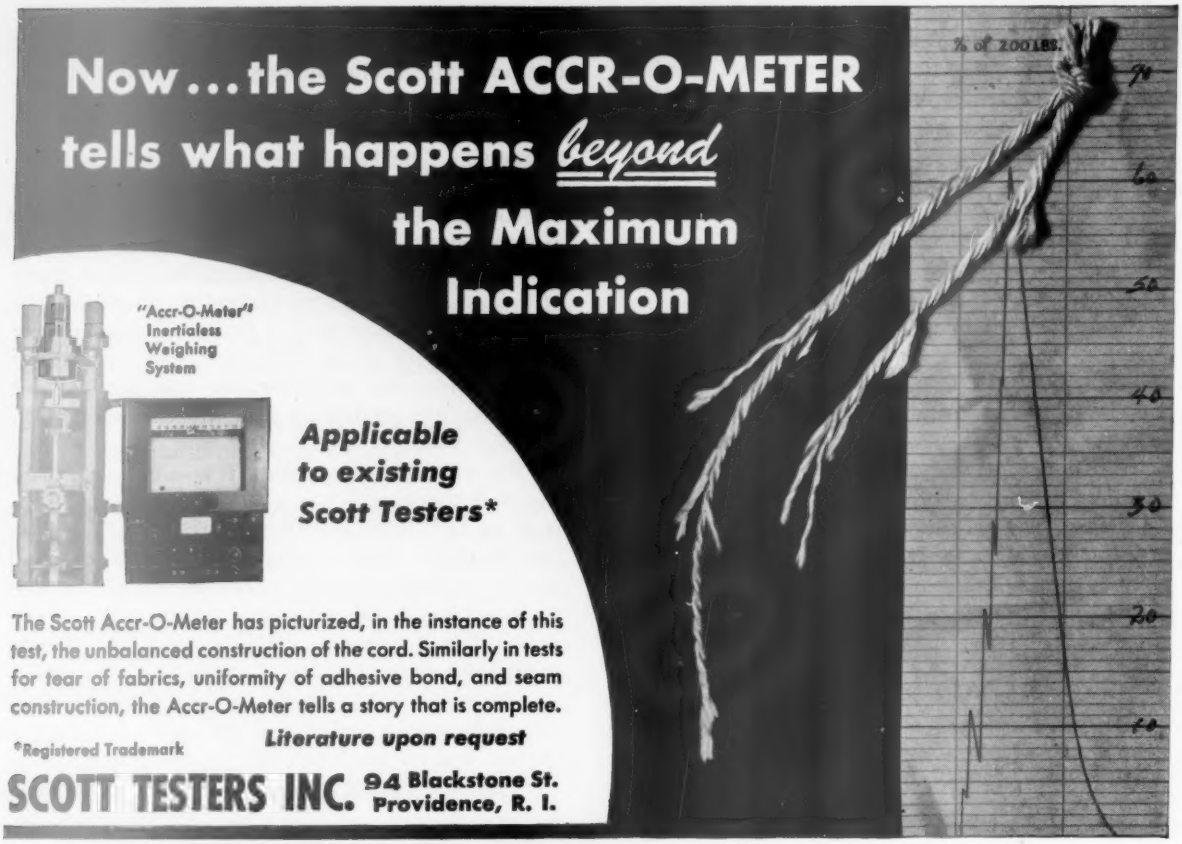

which allows for the maximum shuttle flight time in the loom cycle, and is consistent with the lower shuttle velocity for smooth running. The box lifting mechanism has been simplified, and consists of a one-piece lever bracket with outer and inner bearings for the lever, providing a rigid construction, it is claimed. An improved and simplified torsion spring action has been incorporated to hold the roll against the cam.

An anti-friction cam followed has been introduced to give less wear on the cam face.

A newly designed hinged lever giveway stops the box from lifting when there is a trapped picker on a poorly boxed shuttle, and so prevents breakage, it is said. There is no give or partial operation of this motion while the loom is running properly, but the give-away action is immediate and complete when it is needed, it is explained. Anon. *Textile Age 16*, 50 (November, 1952).

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Abstracts

FIBERS A

Natural Fibers A 1

Cotton merchant offers technical service

Staff. *Textile Industries 116,* 124 (November, 1952).

See front section.

Cotton stands to gain in blending of fibers

Anon. *Textile Age 16,* 34-35 (October, 1952).

Article is a condensation of an address by W. A. L. Sibley of Union, S. C., president of the American Cotton Manufacturers Institute, before the ninth Spinner-Breeder Conference at Greenville, Miss. Mr. Sibley recounts the development of cotton into an almost universal fiber and gives the mill man's stand on the new grading standards of the USDA. He states that while some of the new fibers have very desirable qualities, cotton has some properties which have not as yet been duplicated.

New method for determining cotton fiber maturity, fineness

Anon. *Textile Age 16,* 53-54 (October, 1952).

The United States Department of Agriculture announces a new method for the determination of cotton fiber maturity and fineness called "Causticaire." This method was not developed with the object of obtaining a high correlation with any previous method of maturity determination, but to obtain a fiber maturity value that will have greater significance in evaluating the spinning qualities of cotton. The fiber maturity and fineness as determined by the Causticaire method are obtained from Micronaire readings on untreated cotton and cotton treated with sodium hydroxide. The Causticaire method obviates the need for different Micronaire scales for determining fiber fineness of various types of cotton. Only two scales are required, one for determining maturity and one for direct reading of fineness in terms of weight per inch.

The physics of the textile fiber

G. Bozza. *Riv. Tessile 7,* No. 1, 67-70; No. 2, 207-15 (1952) *in Italian; Brit. Cotton Ind. Res. Assoc. 32,* 762 (1952).

Some physical attributes of textile fibers are

discussed and their effects on one another and on other properties are examined. The properties dealt with include: fiber structure, optical anisotropy, anistropic swelling, appearance under the electron microscope, fiber density, surface properties, wettability, elasticity, behaviour in yarns, thermal effects and heat transmission in fabric form.

Visualizing the position of staple fibers in a sliver

Jeannette Green and J. Ingham. *J. Textile Inst. 43*, T473-88 (1952).

The paper describes a technique used to consider the location of fibers of various lengths in a worsted sliver. The method is used to investigate the control of fiber movement in a drafting zone, and the problem of calculating the fiber end density of a sliver from its thickness profile.

Artificial Fibers A 2

Apparatus for producing acrylo-nitrile fibers

Arthur Cresswell and Irvan Wizon (American Cyanamid Company); U. S. P. 2,614,289 (October 21, 1952).

Apparatus for producing acrylonitrile fibers comprises an advancing rotative means to receive the gelled fiber, means for wet stretching the fiber, a second rotative advancing means with means for drying the fiber, and a fiber heat treating furnace.

Copolymers for producing filaments and films

Goodyear Tire and Rubber Company, U. S. P. 2,615,865-880

These patents disclose novel copolymers which may be used in producing filaments and films. They are copolymers of vinylidene cyanide with mono olefins, vinyl esters, vinyl esters of aromatic acids, styrene and substituted styrenes, vinyl chloride, vinylidene chloride, alkyl methacrylates, halogenated butadience-1, 3 hydrocarbons aliphatic conjugated diolefins, propylene isopropenyl esters, vinyl ester of -halogen substituted acids, 2-mono-halogenated mono-olefins, and alkyl acrylates.

Fiber identification

Wm. R. Wilson. *Can. Textile J. 69*, 75-77 (October 24, 1952).

A microscopic solvent technique is described for synthetic fiber identification. The fibers are stained to definite shades by leuco and general stains, which in most cases will make possible a preliminary identification, dispersed on a dry

slide and covered with a glass. When the field is in focus one drop of the specified solvent is applied and the action observed. A list of synthetic fibers and specific silvents for them is given.

Photoelectric examination of different artificial fibers

J. L. deHauss. *Rayonne Fibres Synth. 8*, No 3 61-66 (1952).

The use of the photocolorimeter Spectral "Z" of the Electro-Synthese in conjunction with Dreaper's reagent (lead acetate/picric acid), and "Wood's ultraviolet light" in the analysis of fibers in a sample of mixed fibers are described. As Dreaper's reagent stains viscose fibers of different diameters to unequal intensity, the photo-colorimeter can be used to determine dyebath concentrations required to render a desired shade.

Fibers produced by cutting film

Marc A. Chavannes (Chavannes Synthetic Fibers, Inc.); U. S. P. 2,614,288 (October 21, 1952).

A method for producing fibers by superposing a web or thermoplastic film on an advancing carrier, preheating the film while on the carrier and applying pressure to parallel, longitudinally—extending areas of the surface of the film to divide it into fibers.

A filter of non-woven fabric

Wm. P. Crawley (American Viscose Corp.); U. S. P. 2,615,477 (October 28, 1952).

A vinyl resin filter medium comprises a fabric of continuous filaments of a vinyl resin and discontinuous fibers of a vinyl resin, the fabric having channels which bend through the fabric from one face thereof to the other.

Sorption of water by viscose rayon at low humidities

J. B. Taylor. *J. Textile Inst. 43*, T489-515 (1952).

Sorption data are presented for moisture regains below 2½% at 25-65° C. for a commercial viscose rayon. The adsorption isotherm is reproducible provided that whenever the rayon is dried most of the water is removed at not too high a temperature. Hysteresis effects are reported in cycles of adsorption-desorption of up 1-2% regain. This is of interest in that capillary mechanisms are inadmissible in this region and swelling effects are likely to be very small or negligible. The low humidity adsorption isotherms may be approximately described by means

of the Freundlich equation. The isoteric heat of adsorption is calculated from the data.

Where are we going in blends?

Jerome Campbell. *Modern Textile Magazine 33*, 31, 47, 48 (November, 1952).

See front section of November issue.

X-51 Acrylic fiber mothproof, easily cleaned

Staff. *Textile Industries 116*, 126 (November, 1952).

See front section.

YARN PRODUCTION B

Carding and Combing B 2

Sliver tester measures length of fibers

Staff. *Textile Industries 116*, 135 (November, 1952).

See front section.

Spinning B 4

Cost-cutting equipment offered for twisting, winding, warping and slashing

Anon. *Textile World 102*, 113-116 (November, 1952).

Textile World featured equipment in this article under the following heading:

Viscosity of homogenized size measured; 800 gal.-per-hr. homogenizer developed for mill use; new "unirail" uptwisters have constructional advantages; soft-package attachment for winding synthetic-yarn high pressure dye packages; king-spool winder attachment raises production; slasher condensate returned without loss; slasher dryer using gas developed at SRRL; clips hold guides firmly on Abbott quillers; high-speed sectional warper developed in Switzerland; automatic cop winder runs 6,000 rpm.; electric stop motion for any type cone creel; "uniflex" uptwister spindle gives speeds to 16,000 r. p. m.; bottom guide for No. 50 winder has long life; king-sized slasher built for carpet mill; thread guide and cleaner easily adjustable; beam brake for slasher creels eliminates waste; mercury-switch warper stop motion acts positively; attachment increases capacity of cylinder dryers; rayon cake holder has adjustable tension; beam handler operated by one man; stop motion for magazine creel improved; higher production in same space with new slasher dryer and small model "gentle-air" dryer dries up to 750 lbs. per hour.

Cost-cutting equipment offered for yarn preparation

Anon. *Textile World 102*, 110, 111, 112 (November, 1952).

Textile World featured descriptions in this article under the following headings:

Fancy cover and side pieces improve woolen card; variation in card roving reduced by compensator; nylon-bearing rolls eliminate lubrication; use full capacity of 14-in. cans with this unit; "hinged-center" spinning tape raises production; durable base for skewers; new-tannage condenser tapes resist emulsifiers; plastic filling bobbin usable with all yarns; mills can now measure roll weighting accurately; German opening, carding, spinning machinery available; long-draft aprons quickly detachable as a unit; synchronized clearer brush cleans between flats and flat ends; new tinting machine controls tint application precisely; woolen-card fancy clothing is self-stripping; all-metal truck for spinning doffers has false bottom; and yarn-processing improvements by Saco-Lowell.

New spinning processes for rayon

Friedrich Ziebach. *Z. Textil Industrie 54*, No. 13, 627-52 (1952); *in German.*

The new rayon spinning process is that carried out by the Stains (France) modified version of the Saco-Lowell direct-spinner or "cracking" machine in which continuous filament rayon (doubled) is broken and then spun so that the intermediate staplising, carding and combing processes are eliminated.

Tension compensating device

Henry C. Uhlig (Howe Twister Corp.); U. S. P. 2,614,381 (October 21, 1952).

A tension compensating device for controlling the tension in a balloon comprises a groove formed by two discs which are mounted in relation with tension detecting means so that when retarding action is required the discs are deflected to provide frictional contact with the doubled strand.

Twist-influential factor in the regularity of yarn

Albert Barella. *Industrie Text.* 315-18 (1952).

A series of experiments were carried out to determine the influence of twist on the regularity of the apparent diameter and the weight per unit length. The regularity of apparent diameter with increasing twist was measured both while the length of the yarn was kept constant and when the yarn was allowed to contract. Results obtained on the coefficient of variation of weight

with increasing torsion, showed a slight diminution which was not considered significant. A new hypothesis is put forward which takes into consideration variations associated with all the factors influencing the two kinds of surface which compose the apparent diameter of the yarn, namely, the surface of the fibers and the surface of the inter-fibrillar spaces.

Winding and Spooling B 5

Machine detects slubs, cuts yarn for removal

Staff. *Textile Industries 116,* 162 (November, 1952).

See front section.

FABRIC PRODUCTION C

Yarn Preparation C 1

Sizing rayon yarn

A. H. Huisinga. *Text. 11, No. 3,* 236-37 (1952); *in Dutch.*

A gelatine formula for sizing rayon weft yarn in cake form is given; this contains Nopco IIII (a sulphonated vegetable oil), synthogel 9 (50% gelatine and 50% dextrin), Calgon and water. The formulation is particularly useful in the preparation of high twist yarn for crepe effects. The inclusion of dye for identification purposes is also dealt with.

Versatile multi-can slasher produces warps of consistent quality

Staff. *Textile Industries 116,* 140 (November, 1952).

See front section.

Weaving C 2

Cost-Reducing equipment offered for weaving

Anon. *Textile World 102,* 117-118 (November, 1952).

Textile World featured descriptions in this article under the following heading:

Conditioning-setting machine handles bobbins or cones; flat harness eye will not damage other frames; picker holder permits parallel adjustments, eliminates screws; jacquard head has several improvements; take-up roll covering sprayed with metal; reeds cleaned with warp drawn in; carpet loom stop motion has indicator panel; package replacement unit for sheaves now available; bobbin-changing silk loom weaves fine colored synthetics; shuttleless French loom runs 250 picks per minute; eliminate harness cords

with these regulators; and hy-du-lignum picker sticks available in the U. S.

Draper xd loom features 2 x 1 filling mixing unit

Anon. *Textile Age 16,* 50 (November, 1952).

See front section.

Swiss loom features patented magazine

Anon. *Textile Age 16,* 52 (November, 1952).

See front section.

Two new cotton looms

Anon. *Textile Age 16,* 50 (November, 1952).

See front section.

Fabric applications C 6

Adhesive for tire cord

Gerald D. Mallory and Theo. R. Ten Broeck (Wingfoot Corp.); U. S. P. 2,615,826 (October 28, 1952).

A bonded composite material comprises a cord embedded in a vulcanized rubber wherein the cord-rubber bonding composition comprises a copolymer of a 1,3-diene monomer and a vinylpyridine monomer, a rubber copolymer of styrene and 1,3-butadiene, and a phenol-formaldehyde resin.

Rubber-proofed fabrics

C. M. Blow and M. Pike. *Rubber Dev. 5,* No. 2, 60-4 (1952); *Brit. Cotton Ind. Res. Assoc. 32,* 808 (1952).

This paper discusses the results of an investigation into the production of rubber proofed fabrics that are permeable to water vapor. Such fabrics are prepared by spreading the base fabric with doughts on natural rubber and special fillers. Here the author deals with the practical preparation of doughts for spreading, the selection of the filler, the effect of variables on vapor permeability, practical trials with permeable proofed fabrics, and the methods used to test the water vapor transmission of fabrics.

STANDARD FINISHING D

Cost-cutting equipment ofiered for wet processing and finishing

Anon. *Textile World 102,* 121-125 (November, 1952).

Textile World featured descriptions in this article under the following headings:

Cloth trimmer now in self-contained unit; static eliminator and tape rewind ease tricot spreading; new padder can be operated either

two-or-three-roll; turret winder increases full-decating production; stop meters optional for soaping systems; combination extractor-dryer halves time, space; slack-selvage eliminator improves coating operation; padder has air motors for more even pressure; open gill box does vigoureux printing on combed sliver; 60-In. Semi-Decater doubles 36-In. machine production; heat exchanger resistant to corrosion; piece dyeing of cotton and synthetic rugs with new dye kettle; new universal coater has self-aligning take-up adjustments; wind-up tension control holds speed, tension constant; new rubber expander suited for wide range of fabrics; new dye reel has V-Bars to provide gripping action; dryer air exhaust improves carbonizing; open width dye kettle has new design features; brass pin plates are rugged; inspecting machine has variable-speed drive; high-temperature, high-pressure machine for knit-goods dyeing; screen-printed fabrics stored on spiral reel; rolling machine designed to handle warp-knit fabrics; railway-type sewing machine have automatic controls; air-pressure roll loading for textile machinery; stainless kettles for textile use; bleaching "Rangettte" uses tensitrol principle; squeeze-roll, padder combines ruggedness, versatility; new A. C. electric guider is sensitive to 1/50 sec.; new dyebeck has improved cloth-handling system; and Union special adds three machines for mills.

Textile lubricant

Ed B. Thomas and Horace F. Oxley (Celanese Corp. of America); U. S. P. 2,614,984 (October 21, 1952).

A textile dressing agent for lubricating textile materials and rendering them difficult to electrify comprises a solution of a diethylamine salt of lauryl sulphonic acid in a lubricating oil.

DYEING AND PRINTING E

Bond machine demonstrated

Anon. *American Dyestuff Reporter 41,* 721 (October 27, 1952).

See front section.

Correction of colors by photocolorimetric means

J. L. deHauss. *Rayonne Fibres Synth. 8,* No. 6, 73-83 (1952), *in French*; *Brit. Cotton Ind. Res. Association 29,* 753 (1952).

Means of analyzing the color of a textile sample on an Electro-Synthese photocolorimeter equipped with six filters is described. A curve of the intensity at different wavelengths is compiled and used for calculating the amount of dye needed in the dyebath to adjust the color in the sample to any desired level.

Dyeing Dacron polyester fiber

Anon. *Textile Age 16,* 36-42 (October, 1952).

Article describes the methods and mechanics of the ways in which Dacron can be dyed with the same class of dyes as acetate. The three methods of dyeing described are aqueous dyeing at the boil with a carrier; aqueous dyeing at high temperatures under presure without a carrier; and the "Thermosol" method of dyeing which consists of impregnation of the fabric by dispersed dyes and pigments followed by a dry heat treatment to bring about absorption of the dye by the fiber.

Dyeing Orlon acrylic fiber

Anon. *Textile Age 16,* 22-31 (October, 1952).

Recent developments indicate wide scope of dyeing possibilities for staple with new process. Orlon acrylic fiber may be dyed into light and medium shades by dyeing at the boil with selected dispersed, basic and vat dyes. Heavier shades with acceptable properties of fastness can be produced from these classes of dyes if the temperature used is increased to 250° F. Article gives the mechanics and the reactions of dyeing for Orlon and the various methods and processes by which it can be dyed.

Dyeing Vicara

Anon. *Textile Age 16,* 43 (October, 1952).

Virginia-Carolina Chemical Corp., makers of Vicara, the synthetic protein base fiber have made available some facts about the dyeing of Vicara. Among these are the facts that Vicara can be dyed with wool colors, vat colors, napthol colors, sulphur colors, and direct colors.

Dyeing the new acrylic fiber Acrilan

J. A. Woodruff. *Textile Age 16,* 52 (October, 1952).

Article states that all form of acid dyes, many acetate dyes, basic dyes, and sulfuric acid esters of vat dyes can be used to dye Acrilan, the acrylic fiber manufactured by the Chemstrand Corp. These dyes can be applied at normal dyeing temperatures. Article gives techniques and methods which can be used to apply these dyes successfully.

Latest procedures for dyeing Dynel

T. A. Feild, Jr. *Textile Age 16,* 45-51 (October, 1952).

Dynel, which is a co-polymer of acrylonitrile

and vinyl chloride is being dyed commercially with many of the acetate and acid dyes. Briefly, there are three basic requirements for the practical commercial dyeing of dynel. These are (1) use of dyeing temperatures of about 205° F. or above, (2) maintenance of the luster of the fiber, and (3) consideration for the fact that the fiber is thermoplastic. Article gives methods and pertinent information about the dyeing of dynel.

Selective dyeing

Henry C. Opin and Dora L. Bell (Celanese Corp. of America); U. S. P. 2,615,781 (October 28, 1952).

A process for coloring textiles comprising both cellulose acetate and superpolyamide fibers to color the former but not the latter comprises subjecting the material to the action of an acid dye and a compound selected from sodium and ammonium thiocyanates.

The Estrocon process

Anon. *Dyer 107, No. 11,* 783 (1952).

A new dyeing method, known as the "Estrocon" process is based on the use of a hydrolysable ester to control the pH of the dyebath. During the dyeing process this ester gradually releases acid homogeneously throughout the system and gives a steady slow exhaustion of the dyebath; this results in improved levelling. Four recipes are given to illustrate the use of this method in the dyeing of loose wool, wool yarn, and nylon yarn.

Vat dyeing

Jean Nicot. *Industrie Text.,* 157-58 (1952).

Details are presented of a greatly simplified procedure for vat dyeing. The method, by combining the boiling of the fabric with impregnation of the dye allows the whole process to take place in one jigger. Wringing of the fabric between of the pigment and subsequent dyeing by alkaline reduction is done away with by adding sodium sulphate to the bath; sodium sulphate causes the dye pigment to precipitate on to the fibers, in readiness for its reduction. Oxidation takes place in the same jigger.

SPECIAL FINISHING F

Compressive shrinking of fabrics

Sanford L. Cluett (Cluett, Peabody and Co., Inc.); U. S. P. 2,615,230 (October 28, 1952).

In shrinking a fabric wherein a fabric-carrying blanket is disposed about a heated drum and an intake roll wherein the roll moves toward and away from the drum, forces are applied to each end of the roll to flex the mid-portion thereof oppositely to that flex caused by the stretched blanket.

Glazing textiles

Andrew H. Little (Imperial Chemical Industries Ltd.); U. S. P. 2,615,231 (October 28, 1952).

Process for producing textiles having a glazed finish and free from projecting ends comprises subjecting to pressure by a polished metal surface a heated textile product having fibers which do not change in shape when heated and fibers of ethylene polymers or interpolymers of ethylene and vinyl acetate.

Method of water-proofing material

Francis W. Minor, Arnold M. Sookne, Milton Harris, Gray L. Pyle; U. S. P. 2,615,824 (October 28, 1952).

Method of water-proofing non-waterproof material comprises immersing the material in a solution in an inert solvent of a lower-monoalkyl-substituted dihalosilane and then exposing the material to elevated temperatures whereby the hydrolyzed substituted silane is condensed in situ to a water resistant deposit.

New finishes offer versatility

L. K. Fitzgerald. *Textile Age 16,* 32-33 (October, 1952).

Dan River finishes for cotton and rayon are an example of progress being made to transform the older fibers into better value for the consumer. Article describes Dan River's Wrinkle-shed process for cotton and the X-2 chemical treatment for rayons and rayon blends.

TESTING AND MEASUREMENTS G

Instruments and Instrumentation G 2

Analysis of forces in yarns

Leon Goosens. *Rayonne Fibres Synth. 8,* 100-104; No. 4, 99-106; No. 5, 47-55 (1952); *Brit. Cotton Ind. Res. Assoc. 32,* 745 (1952).

The author discusses on a statistical basis the distribution and the variation of forces throughout the yarn on a bobbin.

Cost-cutting equipment offered for regulating, controlling, measuring, and testing

Anon. *Textile World 102,* 129-133 (November, 1952).

Textile World featured descriptions in this article under the following headings:

Portable moisture meter accurate to ½ of 1%; dial thermometer meets dyehouse requirements; electric weighing device replaces Scott pendulum and recorder; machine performance recorded in one location; portable pH meters are compact, rugged; accessories for instron tester improve versatility; method for measuring elastic recovery available; instrument checks moisture performance of slashers; new controller fits into tel-o-set system; mechanical cotton blender for testing laboratories; new torsion balances cut weighing time 80%; automatic start motion saves steps, cuts downtime; uster announces three new yarn testers; sizing control developed at Shirley Institute; winding-density gauge is usable anywhere; pH indicator, vacuum-tube voltmeter are line operated; new-model viscometer gives determinations directly; lab dryer maintains precise temperature and humidity; accurate pH meter fits the pocket; microtome cuts to five-millionths of an inch; water-bath temperatures held to ± 0.005° C.; self-contained illumination is integrated into magnifier; sampling viscometer spot-checks batch processes; roll-surface temperatures measured continuously; water content of products measured automatically; viscometer elements measure viscosity under pressure; evaluating fabric "warmth" made easier with new tester; instrument measures thermal conductivity of textiles; electric tachometer for reeves drives; picker-lap uniformity meter developed; and time-temperature controller useful in dyeing, finishing.

Faxfilm used for surface evaluation of textiles

Textile Age 16, 8-9 (November, 1952).

Faxfilm has been developed by the Brush Development Co. for application to the textile industry. It is a process which employs a plastic replica of the material to be studied. One side of a clear plastic film is softened with a solvent and pressed against the material. The replica is then projected in a micro-projector to produce a highly magnified image of the original surface.

Instrument measures fabric temperature without touching it

Staff. *Textile Industries 116,* 129 (November, 1952).

See front section.

Moisture determination

John R. Spalding (E. I. duPont de Nemours and Co.); U. S. P. 2,615,959 (October 28, 1952).

Apparatus for determining the moisture in yarn comprises two electrodes to be applied to a package in closely spaced relationship to form a circuit which includes the resistance of a sample of yarn material with measuring means for determining the moisture content.

Sliver, roving and yarn uniformity tester

Anon. *Textile Age 16,* 78 (October, 1952).

Fielding Instrument Division, Robertshaw-Fulton Controls Co., announces a new yarn and sliver uniformity tester. The instrument will handle sliver, roving and yarn and operates on the dielectric principle using the patented Fielden bridge circuit. Two integrating circuits incorporated into the instrument indicate the mean deviation of the yarn expressed as a percentage of the mean weight, and the mean level of the yarn. A continuous record of the variations is shown on the Esterline Angus pen recorder. A remote electrode can be provided with cable connections 5 or 6 feet long to the instrument permitting direct readings at the spinning frame.

Wrinkling device developed to aid study of fabric crease resistance, resilience

Kenneth A. Howry. *Daily News Record 33,* (November 18, 1952).

See front section.

Yarn weight and moisture content

D. O. Sproule. *J. of Textile Inst. 43,* T455-62 (1952).

Yarn weight and moisture content is measured by transverse vibration. The mass per unit length of the yarn is determined by noting the natural frequency of a measured length of yarn when it is subjected to a known tension. As the moisture content changes, the tension is altered to provide the same natural frequency. The velocity in cm/sec. is equal to the product to the ½ power of the tension times the mass/cm in grams. The high sensitivity of this method can be best exploited by using it to measure changes in the mass/unit length due to changes in temperature or humidity, using a given piece of yarn, or for the measurement of deviations in the uniformity of the yarn, keeping the temperature and the humidity constant.

TEXTILE MILLS H

13th Modern equipment and processing review

Staff. *Textile Industries 116,* 99 (November, 1952).

Textile Industries featured equipment in this

article under the following heading:

Yarns of improved quality at lower cost; improved dyehouse shoe; yarn evenness recorder and integrator; machine crimps nylon at rate of 350 feet per minute; "package" drive for card mounts on cylinder shaft; instrument for remote control of batch dyeing operations; cone mill reducer for worsteds or synthetics; electric eye stop motion for roving frames; vacuum extractor speeds wool scouring operation; all-electric steam cleaner for inside-mill use; binocular microscope makes fabric analysis easy; instrument for continuous indication of moisture in yarn or cloth; instrument eliminates yarn and spindle damage due to faulty bobbins; wool dyeing assistant cuts time in half; section beam features plywood and masonite construction; cold cathode lighting consumes less power, tubes last 20,000 hours; lane marking tape applicator for industrial floor areas; superdraft roving frame for long staple fibers; positive stop motion for pin drafters, gill boxes; faster size preparation by combination of cooking and mechanical agitation; protect fluorescent fixtures from humidity and corrosive fumes; convert sleeve-bearing electric motors to anti-friction type; centralized lubrication system for existing machinery; continuous system for bleaching up to 1500 lb./hr.; oil-free compressor for clean compressed air; custom-built conveyors from stock units; machine produces uniformly tinted stock; revolving back clearers for cotton spinning frames; shuttle truing machine doubles shuttle life; corrosion resistant coating for wood, metal, and masonry; multi-color gravure printer for plastics and textiles; inertialess weighing system for existing Scott tensile strength testers; special-purpose cloth measuring machines; made-in-color acetate fiber; wool card fancy exhaust, filling-in side covers; new bobbin is inherently balanced; Roth single-belt unit can now be converted to double-belt system; maintenance coating won't chip or flake off; industrial heating units economical to operate; high-speed sectional warper for synthetics; laminated rolled tubing for winding glass fibers; self-contained selvage trimmer for piece goods; dobby utilizes inexpensive paper pattern chain; flexible plastic tubing for pressures up to 300 psi; "vari-pitch" sheave bushing provides zexibility of control; hydraulic lifter for heavy cloth rolls; weight measurer for spinning top rolls; shrinkage control for rayon fabrics; sample washer for developing production techniques; double protection for knitting machines; card controller features manual reversing switch for grinding; cloth measuring device produces printed record; instrument detects static electricity on material

in process; grease-sealed top roll with a perpetual warranty; device prevents loom stops due to filling breaks at transfer; anti-static finishes, wool lubricants, other chemicals; uptwister features improved yarn quality; slasher brush reduces shedding at the loom; "wide spread" cotton clamp for Clark fork trucks; single shuttle ribbon loom produces up to 400 ppm; improved ball bearing comb box for cards; heavy-duty tension compensator; electric stop motion for warper creels; pipe and bolt threading machine features new die head; wall paint for service in high humidity; large package spinning for reduced costs; heavy squeeze roll also useful as padder; infrared drying unit for slashers; nylon brush doffer rolls for feeder hoppers feature long life; turret winder provides higher production in full decating; automatic, self-feeding pressure grease cup; belt dressing sprays on; smoother starting for roving frames; securing agents for wool and rayon; American Cyanamid products for the dyehouse; device for wool cards reduces variation in weights; stretch indicator for shrinking, mercerizing, sizing machines, etc.; filling bobbin is virtually indestructible; new type of "cargotainer" has stronger base, legs for heavier materials; vinyl coating requires no surface preparation; chromatography apparatus for dye separation; continuous control of vat dye application; new filling spindle uses less power, prevents oil staining; spinning speed changes easily made with new drive; worsted lubricant controls static build-up; self cleaning atomizer economical to operate; mechanical hold detector for cloth laying-up machine; fiber marking tag withstands washing; lock plate prevents outside hooks or eyes from turning; and improved uniformity analyzer for sliver, roving, yarn.

Cost variables in determining roving package sizes

Rudolph Lux. *The Whitin Review 19*, 25-33 (September-October, 1952).

See front section.

Cost-cutting equipment offered for air conditioning and heating

Anon. *Textile World 102*, 134 (November, 1952).

Textile World featured descriptions in this article under the following heading:

Doors open or close in 3½ seconds; nonchemical water treatment eliminates scale; rotating joint handles high steam pressures; suction strainer developed for air-conditioning systems; too high humidity controlled automatically; new self-cleaning atomizer improves humidi-

fication; and air filter eliminates lint-screen cleaning.

Cost-cutting equipment offered for materials handling

Anon. *Textile World 102,* 126 (November, 1952).

Textile World featured descriptions in this article under the following heading:

New tractor designed for narrow aisles; fiberglass truck molded in one piece; rubber door bends when hit by trucks; "wide-spread" clamp has 69-in. spread; full visibility for operator of this fork truck; and optional counterweights improve lift-truck versatility.

Cost-cutting equipment offered for power generation and transmission

Anon. *Textile World 102,* 135 (November, 1952).

Textile World featured descriptions in this article under the following heading:

Steam generators take on-third normal space; motor-control center has improved features; linked V-belting is leather-faced; new all-steel bearings carry extra-heavy loads; special vise simplifies stocking of roller chain; and 25-HP. variable-speed drive developed.

Cost-cutting equipment offered for waste handling, accessories, and supplies

Anon. *Textile World 102,* 127-128 (November, 1952).

Textile World featured descriptions in this article under the following heading:

Metalizing done 40% faster with new gun; lapper-reversing unit for garnetts eliminates belts; wedge-leveling jacks insure machine alignment; new fluorescent-lighting system gives 40% more light; basic steel framing has many potential end uses; mineral-wool blocks and felts insure low boiler-heat loss; rust-inhibiting wrapper protects machines; wooden-sole shoe for dyehouse workers; fiber roll-end protector half the weight of wood; mobile canteen can serve 150 in 30 minutes; rust-inhibiting fixtures designed for humidified areas; waste machine redesigned; device acts as loudspeaker for phones; thread-waste cutter designed for synthetics and polisher and degreaser handles 25 to 40 quills per minute.

Elimination of harmful industrial smog

Milton H. Irons. *Canadian Textile Journal 71,* 71-72 (November 7, 1952).

See front section.

Lydia cotton mills celebrates 50th anniversary

Anon. *Textile Age 16,* 28 (November, 1952).

See front section.

CHEMISTRY AND PHYSICS OF TEXTILE MATERIALS I

Anti-static agents

Anon. *Textile Age 16,* 56-58 (October, 1952).

The Dyes and Chemical Division of the Du Pont Co. has introduced three new anti-static agents for use on water-insensitive fibers including Dacron and Orlon. The first of these, TLF-701, is a complex organic compound that forms a strong bond with Dacron and Orlon following application and drying. The application of 1% to 3% of TLF-701 produces an excellent anti-static effect on both Dacron polyester fiber and Orlon acrylic fiber. Two companion products, Du Pont Antistat N and TLF-548-E, have a range of properties that make them versatile products for general use. They are antistatic agents possessing water dispersability, oil solubility, wetting, detergent and emulsification properties in soft water. They impart corrosion resistance to metals under many conditions.

Etherification of cellulose II

Sven Rydholm. *Svensk Papperstidn. 55,* 661-62 (1952).

The nature and reactivity of sodium cupricellulose are discussed. It is found, that the probable structure of the compound is of the same nature as that of alkali cellulose but with all 6-hydroxyls and every second 3-hydroxyl inactivated by complex formation with the cupri ion. The accessible hydroxyl groups all react with the same rate, and thus the 2-hydroxyls reacted will represent two thirds of the total degree of substitution. The initial period found in the etherification of alkali cellulose during which only 6-hydroxyls are substituted, is not to be found in the reaction of sodium cupricellulose, as the 6-hydroxyls are blocked. A structure for the cuprammonium cellulose complex analogous to that mentioned for sodium cupricellulose is also suggested.

Improving dyeability of acrylonitrile fibers

George E. Ham (to The Chemstrand Corp.) USP 2,595,848, May 6, 1952.

Fibers made from acrylonitrile polymers are rendered dyeable by including in the polymer a sodium salt of mercaptobenzothiazole or of a related mercapto compound.

Heat-seal adhesives

Harold Wittcoff and Dwight Peerman. *Modern Packaging 26,* 135-40 (November, 1952).

This paper describes procedures for the preliminary evaluation of heat-seal adhesives. The preparation of the film for evaluation, the determination of sealing temperature and sealing range, formation of bonds between various surfaces and determination of bond stability are discussed. In addition, an apparatus recently developed for the determination of sealing range is described.

Measurement of the swelling of viscose

Mme. C. Ruckstahl and G. Durig. *Bull. L'Inst Textile de Fr. 33,* 9-20 (1952) ; *in France.*

During a study of the physico-chemical properties of industrial rayon properties of industrial rayon staple, the authors have defined the influence of the variation of the parameters entering into the measurement of swelling by weight, according to the standard of the bath, the duration and temperature of soaking have no influence. On the other hand, a certain number of parameters come into play to a more or less substantial extent. They are the weight of fiber; the method of centrifugation; the duration of the centrifugation; the speed of the centrifugation (noticeable reduction of swelling when speed increases) ; the wetting agent; the pH of the bath; the condition of the material (de-oiled or not, carded or not, in the form of fabric, yarn, or fiber.)

Measurement of the thickness of transparent films

H. Rahbek and M. Omar. *Nature 169,* 1008-9 (1952) ; *Brit. Cotton Ind. Res. Assoc. 32,* 828 (1952).

A new procedure, adapted from the light-profile microscope to technique of Tolansky is described for the determination of the thickness of transparent films exceeding 1 micron in thickness.

Mechanisms of urea-formaldehyde and melamine-formaldehyde condensations

H. P. Wohnsiedler. *Ind. and Eng. Chem. 44,* 2679-86 (1952).

Various structural mechanisms of condensation have been proposed for the two polymeric systems, urea-formaldehyde and melamine-formaldehyde. Urea and melamine differ in important respects, as is shown in current structural concepts including the structure of their ions. Melamine is more basic than urea and combines with

acids in solutions. This property in turn gives rise to a group of resins in solution designated as acid colloids in which the polymer carries a positive charge. Experimental data show the influence of the important factor—the hydrogen ion concentration—the expressed as pH values, on the melamine-formaldehyde polycondensation reaction.

Microtome prepares sections for electron microscopy

Staff. *Textile Industries 116,* 153 (November, 1952).

See front section.

Swiss Standards Association. Textiles

Carl Z. Draves. *American Dyestuff Reporter 41,* 701-20 (1952).

The textile testing methods adopted by the Swiss Standards Association are presented. The methods include color-fastness of dyeings and prints; evaluation of color-fastness; fastness to light, water-spotting, perspiration, dry-cleaning, rubbing, ironing and acid.

Papers on evaluation of soaps and detergents

Presented at A. S. T. M. meeting of Committee D-12 on Soaps and other Detergents, New York, N. Y., March 19-20, 1951.

A collection of papers on Evaluation of Soaps and Detergents as presented at meetings of A.S.T.M. Committee D-12 on Soaps and other Detergents, and its subcommittees, during March 1951. Discussions on meeting test methods are included in the 58 page pamphlet and were developed as a symposium for the meeting of Subcommittee T-5 on Physical Testing.

Permutoid character of xanthogenation of fibers

K. Hess, H. Kiessig and W. Hoblitz. *Z Electrochem. 55,* 697-708 (1951) ; *Brit. Cotton Ind.* Res. Assoc. 32, 687 (1952).

The reaction of soda cellulose I with liquid and vapour carbon bisulphide has been studied at various temperature conditions, those for maximum carbon bisulphide uptake being determined. X-ray data show that the carbon bisulphide reacts in a statistical manner with all $C_6H_{10}O_5$, NaOH groups in the fiber.

Ratio of tensile strength to melt viscosity for high polymeric materials

Raymond F. Boyer. *J. of Polymer Sci. 9,* 289-94 (1952).

The ratio of tensile strength of a polymer at 25° C. to its melt viscosity at some elevated tem-

perature in the fabrication range is suggested as a quantitative figure of merit for commercial polymers. This ratio goes through a very sharp maximum as a function of molecular weight. The height of the maximum drops sharply with increasing molecular weight heterogeneity, although the location of the maximum along the molecular weight scale is unchanged. This behavior follows because tensile strength depends on number-average, and melt viscosity on weight-average, molecular weight. The possible role of non-Newtonian behavior on these conclusions is discussed. Finally it is shown that the ratio of tensile strength to melt viscosity for a plasticized polymer increases exponentially with plasticier content.

Resin-forming reactions of furfural and phenol

Lloyd H. Brown. *Ind. and Eng. Chem. 44,* 2673-5 (November, 1952).

The effect of the amount and kind of catalyst, amount of water and reactant ratios in the terms of yield and properties of the resultant resins are described. In the presence of water large quantities of NaOH, catalyst are required to get a rapid reaction. In the absence of water, mild catalysts such as alkali carbonates are effective. One-stage resins are obtained with high ratios of furfural to phenol in aqueous media. Novolak resins are obtained with low furfural phenol ratios under relatively anhydrous conditions. Intermediate types are also described.

Stress-strain behavior of thermally contracted collagen

Norman M. Wiederhorn and Gerald V. Reardon. *J. of Polymer Science 9,* 315-325 (1952).

Thermally contracted collagen, when swollen in appropriate media, obeys rubber elasticity theory. On the basis of the measurements which were made, it was possible to establish that the material behaves as if it were a network polymer crosslinked by convalent bonds. However, the chemical nature of these crosslinks is not known. The molecular weight of the chain between points of crosslinking is approximately 55,000. This corresponds to the molecular weight calculated for collagen from x-ray data (60,000) assuming the c axis of the unit cell to be the characteristic 624 Å spacing.

The mechanics of bent yarns

Stanley Backer. *Textile Res. J. 22,* 668-81 (1952).

This paper analyzes the idealized geometry of a bent yarn. Expressions are derived for the calculation of local fiber tensile strain, average strain in the helix half loop, motion of the fibers during bending of the yarn, changes in local helix angles, and fiber curvatures at the bend. The relationships between the geometric quantities of a bent yarn are presented graphically in dimensionless parameters, and conversions to the usual textile terms are provided. Attention is given to the practical applications of this analytical approach to textile problems.

Ultrasonics in the textile industry

J. Salquain. *Teintex 17,* 366-89 (June, 1952); *J. Soc. of Dyers and Cols. 68,* 356 (1952).

The production of ultrasonic radiations is described together with their application in the textile industry, including the dyeing of hydrophobic fibers such as nylon and Orlon, production of staple emulsions, preparation for aqueous solutions of waxes and other water-insoluble products, preparation of aqueous dispersions of oil-solutions dyes, homogenization of glues and finishes, homogenization of dye pastes and dispersions, increase in rate of scouring and dyeing, oxidation of dyes, production on non-shrink wool, and the continuous dyeing of wool.

TEXTILE EDUCATION AND RESEARCH J

Developments in electronics and their application in textile technology

Anon. *Textile Recorder 70,* 79, 80, 81 (September, 1952).

There is no doubt that the great majority of the "wonders" of this twentieth century owe their existance to developments in this comparatively new science [electronics]. The development of instruments based on electronic principles has provided the research worker with a particularly sensitive, accurate and rapid method of measuring a variety of conditions, and industry with a versatile and readily applicable means of process control. Some of the instruments and methods discussed are the use of radio-active isotopes, an ultra-sonic thickness gauge, apparatus for measuring and controlling temperature, electronic heating and devices for measuring yarn irregularity.

High friction of extracted continuous filament yarn

E. Bradbury, A. Reicher. *J. Textile Inst. 43,* T350-53 (1952).

The high friction of extracted continuous filament yarn on clean glass surfaces has been studied and the results briefly reported. Dacron, nylon, viscose, acetate, and silk were tested. Plastic deformation is believed to be a factor influencing the friction.

Heterogeneous hydrolysis of highly methylated cotton cellulose

R. E. Reeves, B. J. Barrett and L. W. Mazzeno, Jr. *J. of Amer. Chem. Soc. 74,* 4491-94 (Sep-20, 1952).

Upon heterogeneous hydrolysis, highly methylated cotton celluloses decrease sharply in viscosity (in chloroform solution) pass through minimum values; and, upon prolonged hydrolysis, show increases in viscosity. Different minimum viscosities for different batches of methyl celluloses are attributed to different crystallite dimensions produced during the methylation procedure; the explanation is supported by the x-ray diffraction patterns of the methyl celluloses. The initial viscosity decreases are regarded as due to chain scission; the latter increases are regarded as due to the more rapid destruction of the lowest viscosity material.

Ion exchange cottons

John D. Gutherie. *Ind. and Eng. Chem. 44,* 2187-89 (1952).

A summary of the preparation of cation and anion exchange cottons and a discussion of their ion exchange properties and possible applications.

Matting-chemical fibers by means of titanium

Andreas Agster. *Melliand Textilber. 33,* 739-43, *in German* (1952).

Viscose or cuprammanium fibers matted by means of titanium as they are used, for example, for curtain fabrics are often severely damaged when exposed to sunlight. This trouble and its remedies are discussed.

Micro-organisms of the human skin and their effect on various textile fibers

H. Dachtler. *Melliand Textilber. 33,* 705-10, *in German* (1952).

The work deals with the germinative zone of the healthy human skin of the human sweat and with the corresponding physiological conditions. Further the author discusses the influence of the isolated bacterias of the skin upon the textile fibers which serve as clothes for the human body.

Preparation of acidic oxycelluloses by action of alkaline hypobromite on cotton cellulose

G. F. Davidson. *J. Textile Institute. 43,* T291-98 (1952).

The oxidation of cotton cellulose by alkaline hypobromite in the dark has been studied over a range of oxygen consumption up to 0.4 atom per glucose unit. It leads to a progressive loss of weight by the cellulose owing to the formation of carbon dioxide and other soluble oxidation products; some of the latter are further oxidized in the solution. The variation of the copper number, fluidity in cuprammonium, and carboxyl content of the resulting oxycellulose with oxygen consumption has been determined. The oxidation is greatly accelerated by light.

Review of Textile Research and Development During 1951

Richard Steel and Cornell Messler. *Textile Res. J. 22,* No. 5 (May 1952).

A review with 1758 references.

South's textile schools keep with revolution in industry

Anon. *America's Textile Reptr. 66,* 11-12, 50 (Apr. 10, 1952).

To fill the demand for trained students for the textile industry in the South, textile schools in recent years have been expanding and modernizing their facilities. Five textile schools or departments at recognized institutions of higher learning in the South are briefly discussed. These include the A. French Textile School at the Georgia Institute of Technology, the Department of Textile Technology at Alabama Polytechnic Institute, Clemson College Textile School, The School of Textiles at North Carolina State College, and The Institute of Textile Technology.

Selection of surface active agents for detergent applications

A. M. Mankowich. *Ind. & Eng. Chem. 44,* 1151-59, (May 1952).

A scientific method of selecting surface active agents for specific detergent applications is proposed, based on the determination of the numerical criteria of the fundamental factors of the detergency process and the "co-factors" for soil removal. Physico-chemical factors of the process studied were suspending power and micellar solubilization. Important generalizations were established relating the suspendability of polar and nonpolar powders, and the micellar solubilization of water-insoluble dyestuffs of different polarity,

with type of surface active agent, tye of builder, concentration, temperature, and pH.

Soiling and soil retention in textile fibers

W. J. Hart & Jack Compton. *Ind. & Eng. Chem. 44,* 1135-41 (May 1952).

A method for studying the kinetics of soil deposition of variables of importance to soil-fiber systems have been investigated, including concentration of soil, concentration of fiber, intensity of agitation during soiling, effect of surfactants, and the thermal coefficient of complex formation and stability. A qualitative mechanism for soil-fiber complex formation is discussed and it is shown that all results tend to confirm the geometric mode of particle binding previously suggested. The techniques and results presented throw light on solic-solid interaction and can be used for investigating a wide range of such systems.

Solvent action of polyacrylonitrile

E. E. Walker. *J. Appl Chem.* (Brit.) 2, 470-81 (1952).

The facts concerning the solvent action of organic substances on polyacrylonitrile have been collected from diverse sources and new observations have been made. A new relationship between the boiling points of organic compounds and their latent heats of evaporation has been devised which is more accurate than the Holdebrand function, and this, together with new calculations and measurements of latent heats of evaporation, has been used to elucidate the relationship between the cohesive energy densities of organic compounds and their solvent power for polyacrylonitrile.

The effects of stretch during spinning of viscose fibers

R. Pinte, P. Rochas and J. Henna. *Rayon Zell. 30,* 85-6 (June, 1952).

Investigation of the effect of stretch during the spinning of rayon fibers, especiallv on the amorphous region, revealed that 0-10% stretch increases the number of linkages in the amorphous region and increases parallelism of the chains without significant increase in their orientation along the direction of the fiber axis. 15-30% stretch rapidly increases the degree of orientation in the axial direction of the macro-molecules of the amorphous regions; an increase in

crystallinity takes place. Stretch over 30% increases orientation and crystallinity, but at a slower rate.

The geometry of knit fabrics made of staple rayon and nylon and its relationship to shrinkage in laundering

Hazel M. Fletcher and S. Helen Roberts. *Textile Research Journal 22,* 466, (July, 1952).

The geometry of six plain, six rib, and three interlock circular knit fabrics made of staple fibers of viscose, acetate-viscose, and nylon has been studied. Data on both gray and finished fabrics for stitch length, diameter of yarn, and wale and course spacings were used in evaluating the equations derived by Pierce for length of yarn in one stitch and for weight per unit area. Measured stitch length ranged from $L=2p+w+4.18d$ to $L=2p+w+6.74d$, as compared to the theoretical value of $L=2p+w+5.94d$ which Pierce derived. Weight of the fabrics calculated by Pierce's equation showed good arrangement with that obtained by weighing a known area.

In laundering tests, it was found that the various yarns shrank or stretched less than 3% in the finished fabrics. The data of wale and course spacings of both the laundered gray and laundered finished fabrics followed parabolic curves. Curves relating the wale and course spacings of the un-laundered materials conformed to no orderly pattern. Those unlaundered materials in which wale and course spacings approximated the parabolic relationship of the laundered fabrics changed the least in the length and width dimensions. Shrinkage in area increased with knitting stiffness for all of the gray fabrics and for the finished viscose; but for the finished acetate-viscose and nylon, shrinkage in area usually decreased as the knitting stiffness increased.

The role of foam in detergent action

D. G. Stevenson. *J. Soc. of Dyers & Cols. 68,* 57-9 (1952).

Foams have the power of sucking oil into the junction between the liquid films or lamellae which separate air bubbles, probably because the curvature of the water-air surface is greatest, and the pressure in the liquid lowest, at these junctions. When a foam carrying lines of oil along these junctions breaks, the oil is dispersed as fine droplets; therefore foams can assist emulsification of oil.

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